

## ***Nymphoides spinulosperma* (Menyanthaceae): a New Species from South-eastern Australia**

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### *Abstract*

*Nymphoides spinulosperma* Aston sp. nov., a yellow-flowered species from south-eastern Australia, is described and its diagnostic features illustrated. Floral and fruiting characters ally this species most closely to *N. montana* Aston, although foliage characters sometimes resemble those of *N. crenata* (F. Muell.) Kuntze.

### **Introduction**

This paper is the fifth in a series leading to a revision of *Nymphoides* in Australia, nine new species having been described in previous papers (Aston 1982, 1984, 1986, 1987). *Nymphoides spinulosperma* Aston shares the common generic characters outlined in Aston (1982, p. 35) and belongs in the 'geminata group' defined on the same page.

### **Taxonomy**

***Nymphoides spinulosperma* Aston, sp. nov.**

*Nymphoidi montanae* Aston affinis sed seminibus tuberculis longis tenuibus acutis, 6-plo (vel plus) longioribus quam latoribus, laminis foliolorum ovatis late crenatis leniter plerumque (saepe simulanti *N. crenata* (F. Muell.) Kuntze) plerumque supra macula parva purpurea ad locum petiolum insertum et saepe viridibus et marronio-brunneis ornatis differt.

*Type:* Victoria, Wimmera, c. 5.5 km (in a straight line) WNW of St Arnaud, along the St Arnaud–Bayena Rd, altitude 160 m, *H.I. Aston* 2872, 21.i.1996 (holotype MEL 2031021; isotypes MEL 2031022, MEL2031023, NSW).

Perennial aquatic. *Stolons* several from the plant base, flexuose, floating or becoming rooted to the substrate when stranded, forking at most nodes, to 1.5 m long, 2.5–3 mm diam., the terminal portions or side-branches developing the inflorescences; internodes several, each c. 15–36 cm long. Basal leaves several; petiole slender, terete, to 11.5–48 cm long, 1–3.5 mm in diameter; blades mostly very broad-ovate or sometimes near-circular in outline, (2.5–)4–9.5(–12) cm long, 1.8–9(–11) cm wide, with width rarely greater than length, deeply cordate (the lobes mostly 27%–45% of the total blade length and separated by a sinus of 5°–35°(–50°) or rarely slightly overlapping), obtuse or rounded, entire to mildly crenate, the upper surface often highly mottled or zoned in

deep-green, yellow-green, maroon-brown and/or brown-tan, but sometimes green only and typically with a small cyclamen-coloured spot at the point of petiole insertion, the lower surface green to whitish-green. *Cauline leaves* from the stolon nodes similar but becoming progressively smaller toward the stolon extremities. *Inflorescence* ('geminata group') terminal on the stolon branches, lax and floating, 3–28 cm long, with a pair of pedicellate flowers and two semi-amplexicaul bracts at each node, the internodes 3–15 in number, each 2–65 mm long, 1.5–3 mm in diameter; bracts lanceolate-ovate, 5–7(–10) mm long; pedicels 28–93(–150) mm long, 1–2 mm in diameter. *Flowers* heterostylous, 5-(6-)partite. *Calyx lobes* lanceolate to narrow-ovate, thick-textured with narrow translucent membranous margin basally, 7.5–12(–14) mm long. *Corolla* 24–45(–55) mm span, yellow. *Corolla lobes* broad-elliptic in outline; mid-section usually glabrous except for a conspicuous transverse fringe of fine papillae near its base and usually also (particularly in long-styled flowers) other papillae forming three short thickened clusters or wings continuous with the proximal edge of the fringe, these clusters adjacent to the centre and sides of the fringe; centre line of mid-section sometimes with one to several lacinia-like projections along its length; side-wings broad, undulate, strongly lacinate (laciniae up to one-third of the total wing width), extending from the apex of the lobe almost to the base. *Corolla tube* papillae consisting of c. 16–33 hairs all free and sessile within the cluster, or sometimes all inserted on a shortly-raised projection of the corolla tube tissue; hairs simple or with 1 or 2 minute spinules near the apex. *Stamens* with filaments c. 0.5–1.7 and 1.0–2.2 mm long in long-styled and short-styled flowers respectively; anthers  $\pm$  linear-lanceolate, c. 2.5–3.5 times as long as broad, c. 2.3–4 mm long. *Gynoecium (long-styled flower)* c. 9.4–12.1 mm long; ovary free except at the base,  $\pm$  linear-conical to ovoid, gradually tapered into the style; placentas 2 (rarely 3), long, extending down the central half to two-thirds of the ovary wall; ovules c. 80–200; style c. 1.8–3.5 mm long; stigmas 2 (rarely 3), each an ovate to broad-rhomboid, shortly papillate, lacinate or shortly-lobed, erect wing c. 3.2–5.3 mm long. *Gynoecium (short-styled flower)* c. 5.2–8.6 mm long; style c. 0.9–2.3 mm long; stigmas c. 1.8–3 mm long, each wing broad-deltoid. *Capsule* ellipsoid or ellipsoid-ovoid, more or less equal to the calyx, 7.5–11.5 mm long, 4–7 mm in diameter. *Seeds* 34–133 per capsule; body of seed ellipsoid but strongly laterally compressed, 1.1–1.5 mm long, 0.8–1.1 mm wide, 0.5–0.7 mm thick, black when mature, moderately densely covered with long fine tapered acute tubercles; tubercles c. 0.6–1 mm long and six or more times as long as wide; basal caruncle pale, moderately thick and conspicuous, encircling a short broad projection of the seed body. (Figs 1, 2)

### *Phenology*

Flowers and early fruits recorded in September in Queensland and New South Wales; also ripe fruits in April in the latter State. Flowers and fruits recorded November–February in Victoria.

### *Etymology*

The epithet *spinulosperma* refers to the diagnostic spinulose appearance of the seeds.

### *Distribution and Conservation Status*

Occurs from southern Queensland to western Victoria. In Queensland, known from only one locality in the Maranoa district. In New South Wales (North West Plains) known from only three locations all within 25 km of each other. In Victoria, known only from the Wannon and Wimmera botanical regions, where recorded from Leah Swamp near Apsley and from four locations in the St Arnaud–Marnoo area.

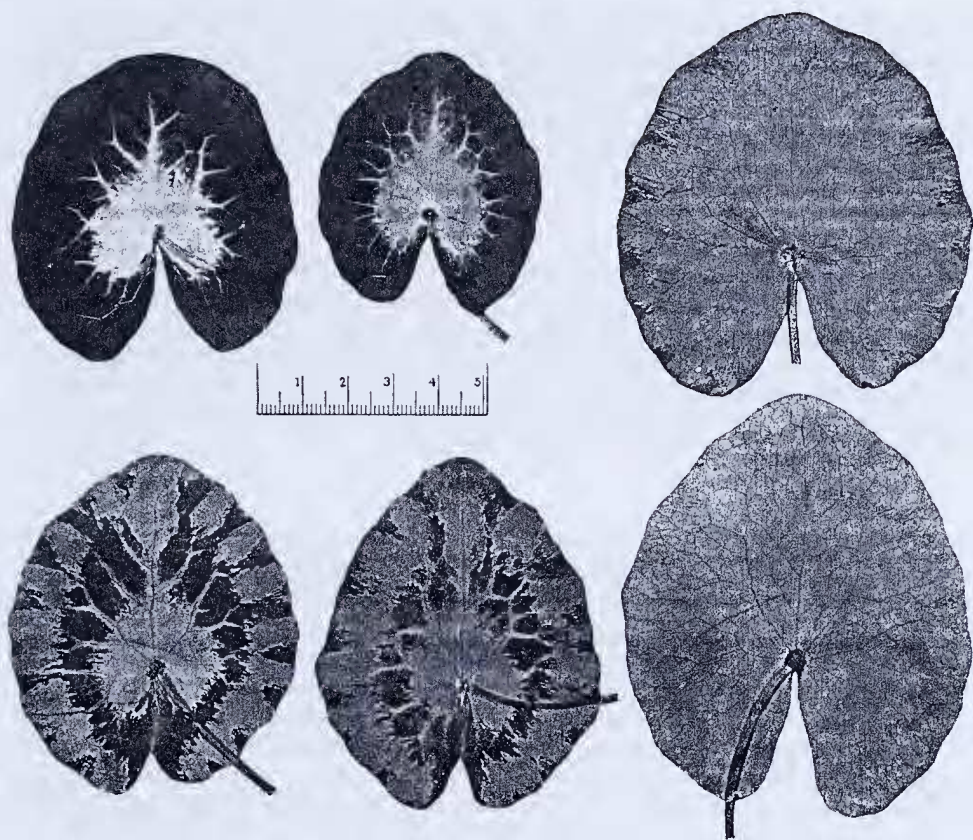


Fig. 1. *Nymphoides spinulosperma*. Upper surface of leaf blades showing colour zoning (upper left), colour mottling (lower left) and leaves with little (upper right) or no (lower right) colour patterning, from Aston 2869. Scale in cm.

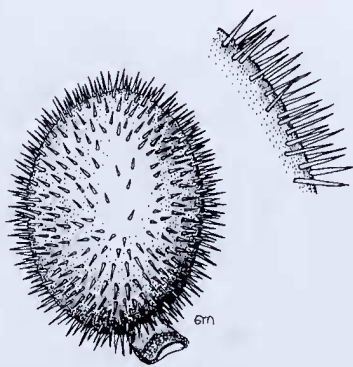


Fig. 2. *Nymphoides spinulosperma*. Seed x30, with enlargement of tubercles, from Aston 2872.

*Nymphoides spinulosperma* is apparently at risk from its very localised occurrences, its dependence on seasonal flooding of shallow swamplands, and the fact that all except two of its known populations are on private property subject to grazing and/or cultivation. The two exceptions are quite small wildlife reserves in Victoria. Further searching in years of suitable flooding may locate additional populations but meantime I suggest a Risk Code of 3KC- (Briggs and Leigh 1988).

### Habitat

Occurs in fresh water to 75 cm deep in seasonal, rarely near-permanent, swamps. In Victoria, swamps are chiefly dominated by *Eragrostis infecunda* and sited mostly in open grazing lands. In New South Wales, initially reported from 'shallow water of a lagoon', but recent collections are from shallow ephemeral waters dominated by *Eleocharis plana* and *Amphibromus nervosus*, again surrounded by grazing and subject to stock intrusion. The Queensland population occurs in a shallow disused road quarry converted to a stock dam. Altitude range c. 150–250 m.

### Field Observations

In Victorian populations I observed in the field in late January, the colour patterning of the leaves appeared to be enhanced by greater exposure to sunlight. It was absent or less pronounced, both in area and in the darkness of the pattern, on leaves that were semi-shaded amongst higher emergents, such as the grass *Eragrostis infecunda*. Colour patterning was very strong in the Queensland and New South Wales populations examined in late September.

Nick Romanowski, who has plants from St Arnaud in cultivation near Forrest, south of Colac, Victoria, has found (*in litt.* 9.vii.1996) that the intensity of leaf colour is greatest in spring to early summer, fades (and is often absent) during summer, then reappears around mid-autumn although not as intensely as in the spring. He suggests that this seasonal change in intensity is most likely related to internal cycles within the plant.

In the field, the cyclamen-pink colour spot of the upper leaf surface at the point of petiole insertion occurred irrespective of leaf age or size and was rarely absent, even from otherwise totally green leaves. In cultivation, Romanowski (*in litt.* 27.vi.1996) has found that this spot has remained a constant, distinctive, feature. It can be a useful guide to identification but neither it nor the leaf colouration, when present, are totally diagnostic as both may sometimes be found in other species, e.g. *N. crenata* (F. Muell.) Kuntze. Rapid response of this species to inundation is shown by *Biddescombe* 320, which was collected in flower and fruit only two months after flooding of the lagoon where it grew.

### Notes

*Nymphoides spinulosperma* is most closely allied to *N. montana* in seed shape and size, but differs in the distinctive fine acute seed tubercles. Seeds of *N. montana* rarely possess tubercles, and when present they are minute and obtuse. Leaves of *N. spinulosperma*, when near-circular and uniformly green above, are distinguishable from those of *N. montana* only by the cyclamen-coloured spot above the petiole insertion. The more characteristic, broad-ovate, entire to mildly crenate, mottled or colour-zoned leaves differ in both shape and colour from any seen on *N. montana* but could be mistaken for some of the less deeply crenate-leaved populations of *N. crenata*. However, non-vegetative parts of this latter species are distinctive.

### Representative Specimens (13 specimens examined)

QUEENSLAND: 20 km NE of St George along the road to Surat, 29 km S of Bindle, *H.I. Aston* 2462, 1.ix.1983 (BRI, MEL, NSW), *H.I. Aston* 2877, 21.ix.1996 (MEL). NEW SOUTH WALES: c. 13 km NNW

of Collie, *H.I. Aston* 2878, 27.ix.1996 (BRI, MEL, NSW); 6 miles [9.6 km] SW of Armatree, *E.F. Biddescombe* 320, 18.iv.1955 (CANB). VICTORIA: Leah Swamp, c. 5 km WSW of Apsley, *K.M. Alcock* batch no. 7, 28.xi.1987–7.ii.1988 (MEL); c. 16 km by road (14 km in a straight line) W of St Arnaud along the Wimmera Highway, *H.I. Aston* 2869, 20.i.1996 (AD, BRI, CANB, MEL, NSW); 26 km (in a straight line) W of St Arnaud. Bryces Road, c. 1 km W of Cope Cope Road, *H.I. Aston* 2870, 21.i.1996 (MEL); Creswicks Well Wildlife Reserve, 5 km NE of Marnoo, *G. Cornwall* no. CS/14/89, 29.xi.1988 (MEL).

## Acknowledgments

I thank Nick Romanowski for notifying me of an unusual population of *Nymphoides* which he located near St Arnaud in December 1995, and for his comments on field and cultivated material. His discovery allowed me to familiarise myself with plants in the field and to reassess certain earlier herbarium collections which had been puzzling. I also thank Neville Walsh for preparing the Latin diagnosis and Enid Mayfield for illustration of the seed.

## References

- Aston, H.I. (1982). New Australian species of *Nymphoides* Seguiet (Menyanthaceae). *Muelleria* **5**, 35–51.
- Aston, H.I. (1984). *Nymphoides triangularis* and *N. elliptica* (Menyanthaceae): two new Australian species. *Muelleria* **5**, 265–70.
- Aston, H.I. (1986). *Nymphoides disperma* (Menyanthaceae): a new Australian species. *Muelleria* **6**, 197–200.
- Aston, H.I. (1987). *Nymphoides beaglesensis* (Menyanthaceae): a new Australian species. *Muelleria* **6**, 359–62.
- Briggs, J.D., and Leigh, J.H. (1988). Rare or threatened Australian plants. Australian National Parks and Wildlife Service, Special Publication No. 14, Canberra.

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